

The CALS Test Network MIL-D-28003 CGM Test Packet







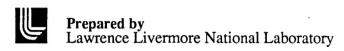


November 25, 1991

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The CALS Test Network **MIL-D-28003 CGM Test Packet**

November 25, 1991

Prepared by

Lawrence Livermore National Laboratory

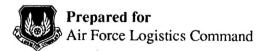
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Preface

This CALS Test Network MIL-D-28003 (CGM) Test Packet is a document which will have periodic updates. These will occur as the reference images and their associated procedures, scripts, and files are corrected for oversights and/or are updated to new versions of the standards.

We acknowledge the following people for their technical assistance: Phil Andrews, Pittsburgh Supercomputing Center; Lofton Henderson, Henderson Software.

Please use the information contained in this packet at your own risk. Send recommendations for change or comments about the content to:

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Abstract

This CALS Test Network MIL-D-28003 (CGM) Test Packet, together with the floppy disk described in Attachment A, contains information useful in conducting tests of the military specification MIL-D-28003 using CGM interpreters. The use of this material helps evaluate and demonstrate industry's and government's use of MIL-D-28003 in accordance with the CALS initiative. The CALS Test Network (CTN), the organization tasked with testing and demonstrating the CALS digital data interchange standards among industry and government, will use this packet in the tests that it conducts. The results derived from this testing will allow the CTN to suggest modifications to vendors' CGM software, the ANSI/ISO standard for CGM, and most importantly, the MIL-D-28003 military specification. However, the greatest use of this test packet is expected to be by industry and Service components as they test and evaluate their own CALS CGM capabilities independently of the CTN.

1 Introduction

The CALS Test Network (CTN) is a Department of Defense (DoD) and industry consortium within the Computer-aided Acquisition and Logistic Support (CALS) Program. It is tasked with testing and demonstrating the interchange of digital technical information using the CALS standards in user applications.

The CTN will use the Graphical Primitive elements reference Computer Graphics Metafile (CGM) described herein during transfer testing of CGM data. Specifically, this reference CGM (reference metafile) demonstrates the use of the CGM elements identified in the military specification MIL-D-28003. The results derived from this testing will allow the CTN to suggest modifications to vendors' CTN software, the ANSI/ISO standard for CGM, and most importantly, the MIL-D-28003 military specification, itself. However, the greatest use of this test packet is expected to be by industry and Service components as they test and evaluate their own CAL CGM capabilities independently of the CTN.

MIL-D-28003 defines a major subset of the ISO 8632 (CGM) standard format to be used for interchanging 2-dimensional (2-D) graphical data between dissimilar system. The CALS standards indicate that this subset is the preferred format for the interchange of technical publication illustrations; it is also beginning to be used for transferring 2-D engineering drawings.

2 Scope

The CTN Graphical Primitive Elements reference CGM is a metafile which contains instances of the 18 CGM primitives allowed by MIL-D-28003. While each allowable primitive is represented, some attribute elements are not covered. For example, the Graphical Primitive Elements reference metafile does not test an interpreter's ability to handle minimum and maximum values, to render all line types and hatch styles, to handle clipping, bundling, and escape elements, or to parse and skip any elements that the interpreter does not support. Later versions of this test packet will extend the scope.

It cannot be stressed enough that the purpose of CTN testing and of this test packet is to evaluate and demonstrate industry and government use of MIL-D-28003 and not to validate conformance of generators, interpreters, or metafiles to MIL-D-28003. The former testing is really "field" testing of the standard itself in an attempt to discover ambiguities and inconsistencies revealed by implementations. The latter testing validates specific files or interpreters/generators and in effect "guarantees" that they conform to MIL-D-28003; this type of testing is not within the CTN charter.

3 Technical Content of the MIL-D-28003 (CGM) Test Packet

The CTN MIL-D-28003 CGM Test Packet you are currently reading contains a set of reference materials that may be used to execute a test involving a vendor's CGM interpreter. It contains:

- 1. A listing of the contents of the CGM Test Packet Floppy Disk.
- 2. An illustration of how the Graphical Primitive Elements reference metafile should look.
- 3. A chart of the attributes used in the Graphical Primitive Elements reference metafile.
- 4. Procedures to follow in conducting a CGM interpreter test.
- 5. A floppy disk containing four different forms of the CTN Graphical Primitive Elements reference metafile.
- 6. An evaluation script (sets of questions) to complete after the Graphical Primitive Elements reference metafile has appeared on the screen.
- 7. A paper printout of the clear text forms of the Graphical Primitive Elements reference metafile. This is included for reference only.
- 8. A glossary listing.
- 9. A list of Acronyms and Abbreviations used.

With the exception of item 5, the floppy disk, the above-mentioned materials are contained in Attachments A through H.

4 Technical Content and Creation of the Reference Material

4.1 The CTN Graphical Primitive Elements Reference Metafile

The CTN Graphical Primitive Elements reference metafile is comprised of all the geometric and many of the annotation CGM elements identified in the MIL-D-28003 specification. The illustration is organized so the elements reside individually by element within one box of a grid. This grid box is labeled to show which element it should contain.

4.2 Development of the Reference CGMs

Both the real and integer forms of the Graphical Primitive Elements reference metafile were hand-created as clear text files, then translated into binary files via GPLOT, a copyrighted program available at no cost from Pittsburgh Supercomputing Center by downloading it over Internet. This hand-editing produced CGM files that incorporate all MIL-D-28003 graphical primitive elements and pass ValidCGM and MetaCALS CGM analyzers with no accountable errors.

One difficulty with designing a test CGM is the breadth of correct interpretations. For example, the description of the Restricted Text element states that the text must fit into a box, but does not describe how the text must fit. Therefore text which fits inside the box as closely as possible is as legal as text which fits anywhere inside the box. This yields different visual representations from the same CGM, which complicates a visual inspection for correctness. Future versions of the standard will not contain these ambiguities.

4.3 The Script

The test packet contains a script which describes how to evaluate the resulting illustration. The script asks questions that try to address DoD's present requirements for transfer of digital illustration data. Another evaluation aide, the CALS Test Network Transfer Test Procedure Checklist, is available separately from the CTN.

5 Conclusion

By following the procedures described in this CTN MIL-D-28003 (CGM) Test Packet and by referring to the script, plot, and data lists contained within, one can examine digital illustration transfers using CGM and MIL-D-28003. This packet does not validate a vendor's conformance to MIL-D-28003, but instead allows the CALS Test Network to demonstrate and evaluate industry/government use of the MIL-D-28003 specification. The packet is also useful to industry and Service components for independent evaluation of their internal MIL-D-28003 capabilities.

ATTACHMENT A Contents of the CTN MIL-D-28003 (CGM) Test Packet Floppy Disk

The floppy disk included with this CTN MIL-D-28003 (CGM) Test Packet contains four files, each a different representation (form) of the same image. These are version "D" of the reference metafiles.

CTN-01i.clr This is a clear text CGM of the integer version of the Graphical Primitive Elements reference metafile. It is not a legal MIL-D-28003 file because it is not a binary format file. The binary version, CTN-01i.cgm, was translated from this file using GPLOT.

CTN-01i.cgm This is the binary CGM of the integer version of the Graphical Primitive Elements reference metafile, created by translation from the clear text CGM, CTN-01i.clr. This metafile is a MIL-D-28003 file.

CTN-01r.clr This is a clear text CGM of the real version of the Graphical Primitive Elements reference metafile. It is not a legal MIL-D-28003 file because it is not a binary format file. The binary version, CTN-01r.cgm, was translated from this file using GPLOT.

CTN-01r.cgm This is the binary CGM of the real version of the Graphical Primitive Elements reference metafile, created by translation from the clear text CGM, CTN-01r.clr. This metafile is a MIL-D-28003 file.

These files include the eighteen graphical primitive elements of CGM that are allowed under MIL-D-28003. Each is displayed in one of eighteen boxes in a three by six array. Only minimal use is made of attribute elements such as LINE WIDTH, LINE COLOUR, LINE TYPE, EDGE WIDTH, EDGE COLOUR, and EDGE TYPE. The eighteen boxes are numbered 1-9 and 11-19. Box 10, corresponding to the GENERALIZED DRAWING PRIMITIVE element, is not included since this element in not permitted by MIL-D-28003.

Text size and spacing were adjusted to give good appearance with one interpreter and may not "fit" as well when viewed with other CGM interpreters.

ATTACHMENT B Illustration of the CTN Graphical Primitive Elements Reference Metafile

Note: This plot incorrectly shows a square as one of the polymarkers. The square should be a circle. Also, the fill pattern in the circle and the ellipse are incorrect as shown.

•					
		+ * 	TFEL D O W W .ABCD N	AbCdEfGhljK AbCdEfGhljK	.ABC+D
(1) POLYLINE	(2) DISJOINT POLYLINE	(3) POLYMARKER	(4) TEXT	(5) RESTRICTED TEXT	(6) APPEND TEXT
(7) POLYGON	(8) POLYGON SET	(9) CELL ARRAY	(11) RECTANGLE	(12) CIRCLE	(13) CIRCULAR ARC 3 POINT
(14) CIRCULAR ARC 3 POINT CLOSE	(15) CIRCULAR ARC CENTRE	(16) CIRCULAR ARC CENTRE CLOSE	(17) ELLIPSE	(18) ELLIPTICAL ARC	(19) ELLIPTICAL ARC CLOSE
LINE TYPE				CALS TEST NETWORK MIL-D-28003 Computer Graphics Meta File: CTN-01Id, Draft 91	file -10-03

ATTACHMENT C Attributes of the CTN Graphical Primitive Elements Reference Metafile

This plot shows the attributes used in each grid section. It is included to assist visual inspection of the CGM.

OPEN FIGURE: LINE: Type.: solid Width: 4 Color: red	OPEN FIGURE: LINE: Type.: solid Width: 3 Color: green	Marker: Mark Size Color . 1 black + 2 red * 3 green o 2 blue x 1 magenta	TEXT ELEMENT: Font: SIMPLEX_ROMAN String Orient Color .ABCD Right magenta .ABCD Diag orange LEFT Left cyan DOWN Down blue	TEXT ELEMENT: Font: SIMPLEX_ROMAN CharHeight 0.02 CharSpace 0.25 Color: blue	TEXT ELEMENT: CharSpace 0.25 '.ABC' DUPLEX_ROMAN Height: 0.02 Color: red '+D' COMPLEX_ROMAN Height: 0.03 Color: blue
(1) POLYLINE	(2) DISJOINT POLYLINE	(3) POLYMARKER	(4) TEXT	(5) RESTRICTED TEXT	(6) APPEND TEXT
CLOSED FIGURE: Edge — Type: solid Width: 2 Color: blue Vis: on Fill — Type: solid Pattern: n/a Color: yellow	CLOSED FIGURE: Edge — Type: solid Width: 2 Color: black Fill — Type: hatch Pattern: Vert lines Color: yellow	r.g.b.y.m .crr gcbrr g.rr.cc g.g.b.m.m .r.g.mm.c .g.y.mgbb.yg.by .yygb.c .mmgy	CLOSED FIGURE: Edge - Type: solid Width: 10 Color: cyan Fill - Type: hatch Pattern: Diag lines // Color: magenta	CLOSED FIGURE: Edge — Type: solid Width: 4 Color: green Fill — Type: hatch Pattern: Diag lines \ Color: blue	OPEN FIGURE: LINE: Type.: solid Width: 1 Color: green
(7) POLYGON	(8) POLYGON SET	(9) CELL ARRAY	(11) RECTANGLE	(12) CIRCLE	(13) CIRCULAR ARC 3 POINT
CLOSED FIGURE: Edge - Type: solid Width: 2 Color: yellow Fill - Type: hatch Pattern: Xhatch Vert/Horiz	OPEN FIGURE: LINE: Type.: solid Width: 1 Color: green	CLOSED FIGURE: Edge - Vis: OFF Width: 2 Color: blue Fill - Type: hatch Pattern; Xhalch Diag/Diag	CLOSED FIGURE: Edge — Type: solid Width: 2 Color: magenta Fill — Type: hatch Pattern: Diag lines	OPEN FIGURE: LINE: Type.: solid Width: 6 Color: GREEN	CLOSED FIGURE: Edge — Type: solid Width: 4 Color: magenta Fill — Type: hatch Pattern: Vert lines
(14) CIRCULAR ARC 3 POINT CLOSE	(15) CIRCULAR ARC CENTRE	(16) CIRCULAR ARC CENTRE CLOSE	(17) ELLIPSE	(18) ELLIPTICAL ARC	(19) ELLIPTICAL ARC CLOSE
LINE TYPE Line types: 1 s Line color: red	olid, 2 dash, 3 dot, 4 Line width: 2	dash-dot, 5 dash-d	ot-dot.	CALS TEST NETWORK MIL-D-28003 Computer Graphics N File: CTN-01Rd/key,	

ATTACHMENT D Procedures for Executing the CTN Reference CGM Interpreter Test

- Receive a floppy disk from the CALS Test Network containing the CTN Graphical Primitive Elements reference CGMs in MIL-D-28003 format.
- 2. Process the binary files through your CGM interpreter.
- 3. Inspect the resulting illustrations and answer the questions listed in the evaluation script (Attachment E). If you answer "no" to any of the questions, explain why on the incident report sheets which follow the script. Attach additional sheets if necessary.
- Generate a hard copy plot of CTN-01i.cgm and CTN-01r.cgm.
- 5. If you are conducting a self-test, collect the script, plot, and any incident reports for self-evaluation. If you pre-arranged a formal CTN test and obtained CTN approval, send the completed evaluation script, plot, and any incident reports to the CALS Test Network Office Test Bed.
- 6. Evaluate the data. The CALS Test Network will, and anyone conducting a self-test should:
 - a. Examine the incident reports, plot, and evaluation script.
 - b. Pinpoint processor, CGM standard (ISO 8632), and/or military standard (MIL-D-28003) anomalies.
 - c. Bring the findings to the appropriate parties for correction (vendor, user, CGM Committee, or sponsor of the military standard).

On CTN-arranged tests, the CTN will publicly publish results of findings.

ATTACHMENT E CTN Graphical Primitive Elements Reference Metafile Evaluation Script

For all elements, check visually against the supplied illustration of the CTN Graphical Primitive Elements reference metafile (Attachment B). The following script raises specific questions to assist in this visual inspection. In general, check that shape, size, line width, color (if used), and general text placement (i.e., somewhere in the box on restricted text, at the bottom of the cell on grid labels, etc.) agree between the resulting picture and the supplied illustration. Answer the script's questions. If you answer "No" to any of them, note why on the incident report sheets which follow this script.

The evaluation is numbered to correspond to the reference CGM illustration.

0)	OVE	CRALL
	a) b)	Is the image divided into a grid with 20 boxes, 18 of which are the same size? Are the grid lines black?
1)	POL	YLINE
	a) b)	Does the shape match the shape of the included plot? Is the line width larger than the width of the lines in the Disjoint Polyline element, but smaller than the width of the lines in the Elliptical Arc element?
	c) d)	Does the text string "(1) POLYLINE" appear near the bottom of the grid box? If in color, are the lines red and the text black?
2)	DIS	JOINT POLYLINE
	a) b)	Does the shape match the shape of the included plot? Does the line width match the width of the line in the Circular Arc 3 Point element?
•	c)	Does the text string "(2) DISJOINT POLYLINE" appear near the bottom of the grid box?
	d)	If in color, are the lines green and the text black?
3)	POL	YMARKER
	a)	Are the five POLYMARKERS, ".", "+", "*", "o", and "x" present and appearing in that order on a line running from the top left to the middle right of the grid? (Note: The illustration of reference metafile in Attachment B incorrectly shows a small square instead of a circle.)
	b)	Does the text string "(3) POLYMARKER" appear near the bottom of the grid?
	c)	Are the "." and "x" smaller than the "+" and " "? Are the "+" and " " smaller than the "*"?
	d)	If in color, is the "." black? Is the "+" red? Is the "*" green? Is the "o" blue? Is the "x" magenta?
4)	TEX	${f T}$
	a)	Does the text string "LEFT" start near the upper right corner and print from right to left, so that it appears as "TFEL"? If using color, is the text cyan?
	b)	Does the text string "DOWN" start near the "L" in "TFEL", and print down, parallel to the right side of the grid box? If using color, is the text blue?
	c)	Is the text string ".ABCD" printed on the horizontal, roughly parallel with the N in "DOWN"? If using color, is the text magenta?
	d)	Is the text string ".ABCD" printed on a roughly 45 degree angle with the "." almost aligned with the "." from the ".ABCD text string mentioned in the previous section? If in color, is the string orange?
	e)	Does the text string "(4) TEXT" appear near the bottom of the grid box? Is the string black?

5)	RESTRICTED TEXT
	a) Is the text string "AbCdEfGhIjK" printed inside the separate boxes within the
	grid box?
	b) Is the box at the top of the grid box roughly square?
	Does the middle box start even with the others on the left hand side and extend to just past half of the grid box width?
·	d) Does the last box start even with the others on the left hand side and extend to the right hand side of the grid box?
	Does the text string fit within the box? Descenders may hang below the box.
	f) Does the text string "(5) RESTRICTED TEXT" appear near the bottom of the grid box? Is this text black?
 .	g) If in color, are the text boxes black? Is the text blue?
6)	APPEND TEXT
	a) Does the text string ".ABC+D" appear near the middle of the grid box?
	b) Is the ".ABC" a smaller font than the "+D"? (Note: the supplied plot does not correctly represent the relative size of the two test strings.)
	c) Does the text string "(6) APPEND TEXT" appear near the bottom of the grid box?
	d) If in color, is the "ABC" red? Is the "+D" in blue?
7)	POLYGON
	a) Does the large isosceles triangle match the shape of the triangle in the supplied plot?
	b) Does the edge width match the edge width for the grid?
	 Does the text string "(7) POLYGON" appear near the bottom of the grid box? If in color, is the triangle outline blue? Is the fill pattern yellow? Is the text black?
8)	POLYGON SET
	a) Does the polygon shape match the shape in the supplied plot?
	b) Does the fill pattern consist of vertical equally-spaced parallel lines?
	c) Is the rightmost edge line invisible?
	d) Is the edge width narrower than the edge width for the grid?
-	e) Does the text string "(8) POLYGON SET" appear near the bottom of the grid box
	f) If in color, is the polygon edge black and is the fill pattern red? Is the text black
9)	CELL ARRAY
	a) Does the cell array pattern match the pattern in the supplied plot? If in color, check that all colors match the chart which appears after question c.
	b) Is the cell array skewed?
	c) Does the text string "(9) CELL ARRAY" appear near the bottom of the grid box? Is the text black?

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	~		~		b		v		m	r Key.	X	Black
	r		g	•	D	r	y r	•	***	i		White
		C	•	•	•	•	b	r	r	i	b b	blue
	g	Ç	r	r	•	C	D	•	c	i	c	cyan
	g	•		•	b	·	m	•	m	i	g	green
	g	r	g	σ		m	m	•	c	i	y	yellow
	•	g	•	g	y			g		i	m	magenta
	•	b	b	•	y	g		b	y	i	r	red
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The RE a) b) c) d) e) f)	is e	X CRA llem 'AN Do Is Do Ar Do If m LE Do (N) Do (N)	X LIZ ent GLI est the	ED is n E he r edg the fi che t color, the co	ot a recta e wi fill pare ext, is to recta fill pare fil	X AWI llow ingle dth catter strin he r wid catte ll pa strir	X ING ed b e sha larg ern in ling feecta aper tttering ff	mate conservation in (12)	match han to thing REC'e out	-28003 and is In the shape in the edge width: f positive-slop ter than the re TANGLE" app line cyan? Is the e shape in the e width of the ele supplied plot is CLE" appear no	the sups anywle equal ear near he text supplied ear not correct as	here else in the plot? Ily-spaced parallel lines? e edge lines? ar the bottom of the grid he black? Is the fill pattern ad plot? a the Elliptical Arc Close ally spaced parallel lines?

10)

11)

12)

13)	CIR	CULAR ARC 3 POINT
	a)	Does the circular arc shape match the shape in the supplied plot? Does the arc
		start and stop in the correct places?
	b)	Does the line width match the width of the lines in the Disjoint Polyline
		element?
	c)	Does the text string "(13) CIRCULAR ARC 3 POINT" appear near the bottom of
	d)	the grid box? If in color, is the arc green? Is the text black?
14)	CIR	CULAR ARC 3 POINT CLOSE
/	a)	Does the arc shape match the shape in the supplied plot? Is the arc closed with a
		chord closure?
	b)	Does the edge width match the width of the edges in the Polygon element?
	c)	Does the fill pattern consist of a horizontal and vertical crosshatch?
	d)	Does the text string "(14) CIRCULAR ARC 3 POINT CLOSE" appear near the
		bottom of the grid box?
	e)	If in color, is the arc outline orange? Is the fill pattern yellow? Is the text black?
15)	CIR	CULAR ARC CENTRE
	a)	Does the arc shape match the shape in the supplied plot?
	b)	Is the edge width narrower than the width of the grid lines?
	c)	Does the text string "(15) CIRCULAR ARC CENTRE" appear near the bottom of the grid box?
	d)	If in color, is the arc outline green? Is the text black?
16)	CIR	CULAR ARC CENTRE CLOSE
20)	a)	Does the arc shape match the shape in the supplied plot?
	b)	Is the closure a pie closure? Does the pie slice to the centre of the circle?
	c)	Is the edge invisible?
	d)	Does the fill pattern consist of positive-slope/negative-slope crosshatch?
	e)	Does the text string "(16) CIRCULAR ARC CENTRE CLOSE" appear near the bottom of the grid box?
	f)	If in color, is the fill pattern red? Is the text black?
17)	ELL	IPSE
	a)	Does the ellipse shape match the shape in the supplied plot?
	b)	Is the ellipse slanted at roughly 45 degrees from the lower left to the upper right?
	c)	Does the edge width match the width of the edges of the Circular Arc 3 Point Close element?
	d)	Does the fill pattern consist of negative slope equally spaced parallel lines? (Note: The fill pattern in the supplied plot is not correct.)
	e)	Does the text string "(17) ELLIPSE" appear near the bottom of the grid box?
	f)	If in color, is the ellipse outline magenta? Is the fill pattern orange? Is the text black?
18)	ELL	IPTICAL ARC
	a)	Does the arc shape match the shape n the supplied plot?
	b)	Does the line width match the larger than the lines in the Polyline element?
	c)	Does the text string "(18) ELLIPTICAL ARC" appear near the bottom of the grid box?
	4)	If in color is the arc outline green? Is the text black?

19)	ELLIPTICAL ARC CLOSE
	a) Does the circle shape match the shape in the supplied plot?
	b) Does the edge width match the width of the edges of the Circle element?
	c) Does the fill pattern consist of vertical equally spaced parallel lines?
	d) Does the text string "(19) ELLIPTICAL ARC CLOSE" appear near the bottom of the grid box?
	e) If in color, is the arc outline magenta? Is the fill pattern green? Is the text black?
20)	LINE TYPE
· · · · · · · · · · · · · · · · · · ·	a) Are 5 distinct line types displayed?
	b) Is the first a solid line?
	c) Is the second a dashed line with long dashes?
	d) Is the third a dashed line with short dashes?
	e) Is the fourth a dashed line which alternates long and short dashes?
	f) Is the fifth a dashed line which alternates a long and 2 short dashes?
	g) If in color, are the lines red?

Incident Report

Incident Report

Incident Report

ATTACHMENT F Clear Text Printout of the Graphical Primitive Elements Reference CGM

The following clear text listings were translated into binary to create MIL-D-28003 CGMs. The different element names used in each file (for example, LineType and line_type) represent different ways to specify the same element in a clear text file. The effect in the binary files is the same, so testers should not be confused by or concerned about the differences in syntax.

```
Listing for CTN-01i.clr

BegMF "CTN-01id"; %91-10-03 11:00%

MFVersion 1;

MFDesc "CTN-01id, 91-10-03, MIL-D-28003/BASIC-1";

MFElemList "DRAWINGPLUS";

VDCType INTEGER;

MaxColrIndex 255;

IntegerPrec -32768, 32768;

ColrPrec 255;

ColrIndexPrec 255;

FontList "HERSHEY:SIMPLEX_ROMAN" "HERSHEY:DUPLEX_ROMAN"

"HERSHEY:COMPLEX_ROMAN";
```

BegPic "All Graphical Primitive Elements";

ColrMode INDEXED;

LineWidthMode SCALED;

MarkerSizeMode SCALED;

EdgeWidthMode SCALED;

VDCExt 0,0,32767, 32767;

BackColr 255 255 255;

% white %

	% MODE		SUMMA	RY					%
	%	(COLOU	R	LINE WIDTH	MARKE	R SIZE	EDGE WIDTH	%
	% SCALING		SELECT	NOL	SECIFICATION	SPECIF	ICATION	SPECIFICATION	%
	% default		INDEXE	D	SCALED	SCALED	-	SCALED	%
Re	gPicBody;								
DU	ColrTable	0			%	index	color	%	
		255	255	255	%	0	white		
		0	0	0	%	1	black		
		255	0	0	%	2	red	%	
		0	255	0	%	3	green		
		0	0	255	%	4	blue	%	
		255	255	0	%	5	yello	w %	
		255	0	255	%	6	mage		
		0	255	255	%	7	cyan	%	
		255	255	255	%	8	white	%	
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		2767,3277)			
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		7) (10922,3			
		7) (16384,3			
		21845,3276			
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		meter Su	mmary		%
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% INI				COLOUR	%
% defa				set	% %
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				06,30801) (3386,32112)	70
Line		369) (4806,3 2112) (4806,		06,28180) (655,32112)	
		301) (4806,2		86,26869) (655,29490)	
		(4000,2 (180) (2021,2		00,200007 (000,20 100)	
	(000,201	.00) (2022,2	20000),		
% Box 2 -	DISJOIN	T POLYL	INE %		
	Vidth 3.0				
LineC					
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% 1		1	3.0	3 green	% %
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${f DisjtI}$			(6117,32112)	(6117,30801) (7482,32112)	
			6117,29490)	(6117,28180) (10267,32112) (7482,26869) (10267,29490)	
			(6117,26869) (8847,26860)	•	
	(102	201,2010U)	(8847,26869)	,	

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MarkerType 2				
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% BUNDLE				
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% default = 1	2	2.0	2 red	
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Marker (12451,	,30801);			
MarkerType 3	:			
MarkerSize 3.				
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 MARKER BUNDLE INDEX default = 1 Marker (13434) 	TYPE 3 	SIZE	COLOUR	
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% MARKER % BUNDLE % INDEX % default = 1 % Marker (13434) MarkerType 4 MarkerSize 2. MarkerColr 4; % MARKER % BUNDLE % INDEX	TYPE 3 .29490); ; 0; PARAMET	SIZE 3.0 TER SUM	COLOUR 3 green MARY COLOUR	
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		TEXT	EXPAN	CHAR.	TEXT
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% INDEX	INDEX	default	set	set	set
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% 1 ~	1	1	0.0	0.20	
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% set % 655 % Text 17039,2 TextColr 7; CharOri 0,1,1 TextPath LE % TEXT PA % BUNDLE % INDEX % default % 1 % % CHAR	-1,1,1,1 '7852,final,". 1,0; FT; ARAMETER FONT INDEX set 1 CHAR. ORIENT	right ABCD"; SUMMARY TEXT PRECISION default 1 TEXT PATH	EXPAN FACTOR set 0.8 TEXT ALIGN	CHAR. SPACE set 0.25 CHAR SET INDEX	TEXT COLOUR set 7 cyan ALT CHAR SET INDEX
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6 BUNDLE		SUMMARY TEXT	EXPAN	CHAR.	TEXT	
6 INDEX		PRECISION		SPACE	COLOUR	
6 default	set	default	set	set	set	
6 1	1	1	0.8	0.25	4 blue	
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% set	set	set	default	default	default	
% 655	0,1,1,0	down	normal	1	1	
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ntStyle EMP	TY;					
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	and the second second					

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Text 27961,27	,	l,".ABC";				
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IntStyle SOLII HatchIndex 1; FillColr 5; % CLOSED F % INTERIOR % STYLE % set % SOLID % % EDGE	FIGURE PA FILL COLOUP set 5 yellow EDGE	HATCH INDEX set 1= FILL REF	PATTERN INDEX default 1 CHAR SET	EDGE BUNDLE INDEX def = 1 ALT CHR	EDGE TYPE default	EDGE WIDTH set
IntStyle SOLII HatchIndex 1; FillColr 5; % CLOSED F % INTERIOR % STYLE % set % SOLID % % EDGE % COLOUR	FIGURE PAFILL COLOUF set 5 yellow EDGE VISIBIL.	HATCH INDEX set 1= FILL REF POINT	PATTERN INDEX default 1 CHAR SET INDEX	EDGE BUNDLE INDEX def = 1 ALT CHR SET NDX	EDGE TYPE default	EDGE WIDTH set
IntStyle SOLII HatchIndex 1; FillColr 5; % CLOSED F % INTERIOR % STYLE % set % SOLID % % EDGE	FIGURE PA FILL COLOUP set 5 yellow EDGE	HATCH INDEX set 1= FILL REF	PATTERN INDEX default 1 CHAR SET	EDGE BUNDLE INDEX def = 1 ALT CHR	EDGE TYPE default	EDGE WIDTH set

I F F	ox 8 - PontStyle FillColr HatchIn EdgeWic EdgeCol	HAT 2; dex 2; dth 1.	:	%							
			FIGURE	PAR	AMETER	SUMM	ARY -				%
	6 INTE				HATCH	PATTI		EDGE	EDGE	EDGE	%
9	6 STYL	E	COLO	OUR	INDEX	INDEX		BUNDLE	TYPE	WIDTH	%
	% set		set		set	default	t	INDEX	default	set	%
	% HAT(%	CH	2 red		2 1 1 1	1		def = 1	1	1.0	% %
9	% EDGE	3	EDGE	C	FILL REF	CHAR	SET	ALT CHI			%
9	% COLC	UR	VISIE	BIL.	POINT	INDEX		SET NDX			%
9	% set		set		default	defaul	t	default		•	%
9	% 4 blue		on		ll corn	1		1			%
	% Polygon	2 ₀ + (61	17 17020	 2) vric		aria (Of	 :00 000	82),invis, (1	0495 1702	O) alogovác	%
1	rotygon							022),invis, (1 022),closevi		9),ciosevis,	
			RRAY %	·							
	CellArr	ay			_				~-		
•	% P	2000)	Q		F		nx	•	CI	%	٠.
(12468,2		(14500,1				9		65535	0101010	
	2	0	3	0	4	0	5	-		010101%	
	0	7	8	0	0	2	2			001100%	
	3	7	8	0	0	0	4			000111%	
	3	0	2	2	0	7	0			101001%	
	3	0	3	0	4	0	6			010101%	
	0	2	0	3	0	6	6	-		101101%	
	0	3 4	0 4	0	5 5	0	6			010110%	
	0			0		3	0			011011%	
	0	5	5 6	0	0 0	3	4 5			001101% 001100%	
					_		J	U	0; %011	001100%	
% Bo	x 10 no	t used;	GDP no	t in M	IIL-D-28003	8 %					
	x 11 - F fillColr		NGLE %	6		•					
	IatchIn										
	EdgeWie										
	EdgeCol		,								
			FIGURE	PAR	AMETER	SUMM	ARY -				%
	6 INTE				HATCH	PATTI		EDGE	EDGE	EDGE	%
9	6 STYL	\mathbf{E}	COLC	OUR	INDEX	INDEX		BUNDLE	TYPE	WIDTH	%
9	6 set		set		set	default		INDEX	default	set	%
9	6 НАТ(6	CH	6 mag	genta	3 ///	def = 1		1	1	10.0	% %
9	6 EDGE		EDGE	C	FILL REF	CHAR	SET	ALT CHI	3		%
	6 COLO				POINT	INDEX		SET NDX			%
	6 set		set		default	default	;	default			%
	67 cyar		on		ll corn	1		1			%
	6										%

```
% Box 12 - CIRCLE %
  FillColr 4:
  HatchIndex 4;
  EdgeWidth 4.0;
  EdgeColr 3:
   % CLOSED FIGURE PARAMETER SUMMARY --
                                                                 EDGE
                                                                              %
                          HATCH
                                                         EDGE
                                   PATTERN
                                                EDGE
                 FILL
   % INTERIOR
                                                BUNDLE TYPE
                                                                              %
                                                                 WIDTH
                 COLOUR INDEX
                                   INDEX
   % STYLE
                                                                              %
                                                INDEX
                                                         default
                                                                 set
                                    default
                 set
                          set
   % set
                                                                              %
                                                def = 1
                                                         1
                                                                 4.0
                          4\\\
                                    1
   % HATCH
                 4 blue
                                                                              %
   %
                                                                              %
                                                ALT CHR
                          FILL REF CHAR SET
                 EDGE
   % EDGE
                                                                              %
                                                SET NDX
                          POINT
                                    INDEX
                 VISIBIL.
   % COLOUR
                                                                              %
                                                default
                                    default
                          default
                 set
   % set
                                                                              %
                                                1
                          ll corn
                                    1
   % 3 green
                 on
   % -----
   Circle (24575,19660),2458;
% Box 13 - CIRCULAR ARC 3 POINT %
   LineType 1;
   % LINE Parameter Summary -----
                       LINE
                                 LINE
               LINE
   % BUNDLE
                                                                %
                                 COLOUR
                        WIDTH
   % INDEX
               TYPE
                                                                %
                                 set
                        set
   % default
               set
                                                                %
                        3.0
                                 3 green
   %1
                1
   Arc3Pt (32112,21299) (28398,17694) (31129,17039);
% Box 14 - CIRCULAR ARC 3 POINT CLOSE (CHORD) %
   FillColr 5;
   HatchIndex 5;
   EdgeWidth 2.0;
   EdgeColr 9;
   % CLOSED FIGURE PARAMETER SUMMARY -----
                                                                              %
                                                          EDGE
                                                                 EDGE
                                                EDGE
                          HATCH
                                    PATTERN
   % INTERIOR
                 FILL
                                                                              %
                                                                  WIDTH
                 COLOUR INDEX
                                    INDEX
                                                BUNDLE TYPE
   % STYLE
                                                                              %
                                    default
                                                INDEX
                                                          default
                                                                 set
                           set
   % set
                 set
                                                                              %
                                                def = 1
                                                                  2.0
                           4 ###
   % HATCH
                 5 yellow
                                                                              %
   %
                                                ALT CHR
                                                                              %
                 EDGE
                           FILL REF CHAR SET
   % EDGE
                                                                              %
                          POINT
                                    INDEX
                                                SET NDX
                 VISIBIL.
   % COLOUR
                                                                              %
                                                default
                                    default
   % set
                 set
                           default
                                                                              %
                          ll corn
                                    1
                                                1
                 on
   % 9 orange
   Arc3PtClose (4915,11796) (1092,7864) (3823,6553),chord;
```

% LINE Pa % BUNDLE % INDEX % default	LINE L TYPE V	INE LI	NE DLOUR		% % % %	· ":
%1			reen		%	
%					%	
% x ArcCtr 819		Xs DYs 898, 10485,	DXe DYe 9175, 8192,	rad 2458;	%	
Box 16 - CIRC	ULAR ARC C	ENTRE CLO	SE (PIE) %			
HatchIndex	6;					
FillColr 2;						
EdgeColr 4;	r.					
EdgeVis OF		RAMETER	SUMMARY			
% INTERIO	R FILL	HATCH	PATTERN	EDGE	EDGE	EDGE
% STYLE		INDEX	INDEX	BUNDLE		WIDTH
% set	set	set	default	INDEX	default	
% HATCH	2 red	6 xxx	1	def = 1	1	2.0
%						
% EDGE	EDGE		CHAR SET	ALT CHR		
% COLOUR % set	VISIBIL.		INDEX	SET NDX		
% set % 4 blue	set off	default ll corn	default 1	default 1		
%			_			
%	x y	DXs	DYs DXe	DYe ra	d type	
ArcCtrClose		330, 5898,		, 8192, 24		e;
D. 10 BILLI	OF of		1			
Box 17 - ELLII FillColr 9;	SE %					
HatchIndex	1:		•			
EdgeColr 6;	-,					
	;					
EdgeVis ON	DICITION DA	RAMETER	SUMMARY .			
	FIGURE PA		PATTERN	EDGE	EDGE	EDGE
EdgeVis ON % CLOSED % INTERIO	R FILL	HATCH	FAILERN			XXXX XX CD XX
EdgeVis ON % CLOSED % INTERIO % STYLE	R FILL COLOUR	INDEX	INDEX	BUNDLE	TYPE	WIDTH
EdgeVis ON % CLOSED % INTERIO % STYLE % set	R FILL COLOUR set	INDEX set	INDEX default	INDEX	default	set
EdgeVis ON % CLOSED % INTERIO % STYLE % set % HATCH %	R FILL COLOUR set 9 orange	INDEX set 4\\\	INDEX default 1	INDEX def = 1	default 1	
EdgeVis ON % CLOSED % INTERIO % STYLE % set % HATCH % % EDGE	R FILL COLOUR set 9 orange EDGE	INDEX set 4\\\ FILL REF	INDEX default 1 CHAR SET	INDEX def = 1 ALT CHR	default 1	set
EdgeVis ON % CLOSED % INTERIO % STYLE % set % HATCH % % EDGE % COLOUR	R FILL COLOUR set 9 orange EDGE VISIBIL.	INDEX set 4\\\ FILL REF POINT	INDEX default 1 CHAR SET INDEX	INDEX def = 1 ALT CHR SET NDX	default 1	set
EdgeVis ON % CLOSED % INTERIO % STYLE % set % HATCH % % EDGE	R FILL COLOUR set 9 orange EDGE	INDEX set 4\\\ FILL REF	INDEX default 1 CHAR SET	INDEX def = 1 ALT CHR	default 1	set

```
% Box 18 - ELLIPTICAL ARC %
   LineWidth 6.0;
   LineType 1;
   % LINE Parameter Summary -----
                                  LINE
   % BUNDLE
                LINE
                        LINE
                                 COLOUR
                                                                %
                TYPE
                        WIDTH
   % INDEX
                                                                %
   % default
                set
                        set
                                  set
   %1
                1
                        6.0
                                  3 green
                                     % centre point
                                                          %
   EllipArc (22282,9175)
                                     % 1st CDP endpoint
                                                          %
           (19158,6226)
                                     % 2nd CDP endpoint
                                                          %
           (19551, 10158)
                                     % DX start.DY start
                                                          %
           (1311.3604)
                                     % DX_end,DY_end
           (3277, -2949);
% Box 19 - ELLIPTICAL ARC CLOSE (PIE) %
   FillColr 3:
   HatchIndex 2:
   EdgeWidth 4.0:
   % CLOSED FIGURE PARAMETER SUMMARY --
                                                  EDGE
                                                           EDGE
                                                                   EDGE
                                                                                 %
                                     PATTERN
                 FILL
                           HATCH
   % INTERIOR
                                                                                %
                                                  BUNDLE TYPE
                                                                    WIDTH
                                     INDEX
   % STYLE
                  COLOUR INDEX
                                                                                %
                                     default
                                                  INDEX
                                                           default
                                                                   set
   % set
                  set
                           set
                                                                                 %
                                                  def = 1
                                                                   4.0
   % HATCH
                  3 green
                           2 | | |
                                                                                 %
   %
                           FILL REF CHAR SET
                  EDGE
                                                  ALT CHR
                                                                                 %
   % EDGE
                                     INDEX
                                                  SET NDX
                                                                                 %
   % COLOUR
                  VISIBIL.
                           POINT
                                                  default
                                                                                 %
   % set
                  set
                           default
                                     default
                                                                                %
   % 6 magenta
                           ll corn
                                     1
                                                  1
                  on
                                                          %
   EllipArcClose (27852,9175)
                                     % centre point
                (24575,6226)
                                     % 1st CDP endpoint
                                                          %
                                     % 2nd CDP endpoint
                                                          %
                (24903, 10158)
                                     % DX start.DY start
                (1311.3932)
                                                          %
                (3277, -2621)
                                     % DX_end, DY_end
                pie;
% Box "20" - LINE TYPE %
   LineColr 2;
   LineWidth 2.0;
   LineType 5;
   % LINE Parameter Summary -----
                                LINE
                                           LINE
                                                                %
   % BUNDLE
                LINE
                                           COLOUR
                                                                %
   % INDEX
                TYPE
                                WIDTH
                                                                %
                                           set
   % default
                                set
                set
                                                                %
                                2.0
                                           2 red
                5 dash-dot-dot
   Line (1638,655) (19660,655);
```

% BUNDLE	LINE		LINE	%	
% INDEX	TYPE	WIDT		%	
% default	set	set	set	%	
% 1		2.0		%	
%Line (1638,983				· %	
	5,,(20000,000	• • • • • • • • • • • • • • • • • • • •			*
LineType 3;				01	
% LINE Par % BUNDLE		LINE	TINE	% %	
			H COLOUR	%	
% default		set	set	%	
% 1				%	
			D 104		
Line (1638,13				~	
LineType 2;					
% LINE Par	ameter Su	mmary		%	
% BUNDLE	LINE	LINE	LINE H COLOUR set 2 red	%	
% INDEX	TYPE	WIDT	H COLOUR	%	
% INDEX % default	set	set	set	%	
% 1	2 dash	2.0	2 red	%	•
%Line (1638,163				%	
	,0, (10000,10				
LineType 1;	ameter Su	mmary		· %	
% BUNDLE			LINE	%	1.7
% INDEX				%	
% default	set	set	set	%	
% 1	1 solid	2.0		%	
%				%	
Line (1638,196	66) (19660,19	66);			
abels in Boxe	s %				
aneis III Duxe	0 /0				
TextFontInde	x 3;				
TextFontInde TextPrec STI	x 3; ROKE;				
TextFontInde TextPrec STI CharExpan 0	x 3; ROKE; .8;				
TextFontInde TextPrec STI CharExpan 0 CharSpace 0.	x 3; ROKE; .8;				
TextFontInde TextPrec STI CharExpan 0 CharSpace 0.0 TextColr 1;	x 3; ROKE; .8; 01;				
TextFontInde TextPrec STI CharExpan 0 CharSpace 0.0 TextColr 1; CharHeight 4	x 3; ROKE; .8; D1; 50;				
TextFontInde TextPrec STI CharExpan 0 CharSpace 0. TextColr 1; CharHeight 4 CharOri 0,1,1	x 3; ROKE; .8; 01; 50; ,0;				
TextFontInde TextPrec STI CharExpan 0 CharSpace 0. TextColr 1; CharHeight 4 CharOri 0,1,1 TextPath RIG	x 3; ROKE; .8; 01; 50; ,0; GHT;	OUNDAL DY			
TextFontInde TextPrec STI CharExpan 0 CharSpace 0.0 TextColr 1; CharHeight 4 CharOri 0,1,1 TextPath RIG % TEXT PA	x 3; ROKE; .8; 01; 50; ,0; JHT; .RAMETER	SUMMARY	DVDAN CHAN	minya	
TextFontInde TextPrec STI CharExpan 0 CharSpace 0.0 TextColr 1; CharHeight 4 CharOri 0,1,1 TextPath RIC % TEXT PA % BUNDLE	x 3; ROKE; .8; .01; 50; ,0; JHT; .RAMETER FONT	TEXT	EXPAN CHAR		
TextFontInde TextPrec STI CharExpan 0 CharSpace 0.0 TextColr 1; CharHeight 4 CharOri 0,1,1 TextPath RIC % TEXT PA % BUNDLE % INDEX	x 3; ROKE; .8; D1; 50; ,0; GHT; .RAMETER FONT INDEX	TEXT PRECISION	FACTOR SPACE	E COLOUR	
TextFontInde TextPrec STI CharExpan 0 CharSpace 0.0 TextColr 1; CharHeight 4 CharOri 0,1,1 TextPath RIC % TEXT PA % BUNDLE % INDEX % default	x 3; ROKE; .8; D1; 50; ,0; GHT; .RAMETER FONT INDEX set	TEXT PRECISION set	FACTOR SPACE set set	E COLOUR set	
TextFontInde TextPrec STI CharExpan 0 CharSpace 0.0 TextColr 1; CharHeight 4 CharOri 0,1,1 TextPath RIC % TEXT PA % BUNDLE % INDEX % default % 1	x 3; ROKE; .8; D1; 50; ,0; GHT; .RAMETER FONT INDEX	TEXT PRECISION	FACTOR SPACE	E COLOUR	
TextFontInde TextPrec STI CharExpan 0 CharSpace 0.1 TextColr 1; CharHeight 4 CharOri 0,1,1 TextPath RIC % TEXT PA % BUNDLE % INDEX % default % 1	x 3; ROKE; .8; 01; 50; ,0; GHT; RAMETER FONT INDEX set 3	TEXT PRECISION set STROKE	FACTOR SPACE set set 0.8 0.01	E COLOUR set 1 black	
TextFontInde TextPrec STI CharExpan 0 CharSpace 0.0 TextColr 1; CharHeight 4 CharOri 0,1,1 TextPath RIC % TEXT PA % BUNDLE % INDEX % default % 1 % % CHAR	x 3; ROKE; .8; .01; 50; ,0; GHT; RAMETER FONT INDEX set 3	TEXT PRECISION set STROKE TEXT	FACTOR SPACE set set 0.8 0.01 TEXT CHAR	E COLOUR set 1 black SET ALT CHA	R
TextFontInde TextPrec STI CharExpan 0 CharSpace 0. TextColr 1; CharHeight 4 CharOri 0,1,1 TextPath RIG	x 3; ROKE; .8; 01; 50; ,0; GHT; RAMETER FONT INDEX set 3	TEXT PRECISION set STROKE	FACTOR SPACE set set 0.8 0.01	E COLOUR set 1 black SET ALT CHA K SET INDI	R

```
164,24575.
                       final.
                                    "(1) POLYLINE";
Text
         5625,24575,
                       final,
                                    "(2) DISJOINT";
Text
                                    " POLYLINE";
         5625,23920,
Text
                       final,
                                    "(3) POLYMARKER";
          11086,24575,
                       final,
Text
                                    "(4) TEXT";
Text
          16547,24575.
                       final.
Text
         22008.24575.
                       final.
                                    "(5) RESTRICTED":
                                    " TEXT";
         22008,23920.
                       final,
Text
         27470.24575.
                                    "(6) APPEND";
Text
                       final.
                                    " TEXT";
Text
         27470,23920,
                       final.
                                    "(7) POLYGON";
Text
          164,14745,
                       final.
Text
          5625,14745,
                       final.
                                    "(8) POLYGON":
                                    " SET";
Text
          5625,14090,
                       final,
                                    "(9) CELL";
Text
          11086,14745,
                       final,
                                    " ARRAY";
Text
          11086,14090,
                       final
                                  LIZED DRAWING PRIMATIVE (GDP) - %
 % Not Included - - - (10) GENERA
Text
          16547.14745.
                       final.
                                    "(11) RECTANGLE":
          22008.14745.
                                    "(12) CIRCLE";
Text
                       final.
                                    "(13) CIRCULAR";
Text
         27470.14745.
                       final.
                                    " ARC 3 POINT";
         27470,14090,
Text
                       final,
Text
          164.4915.
                       final.
                                    "(14) CIRCULAR":
                                    " ARC 3 POINT";
Text
          164,4260,
                       final,
                                    " CLOSE";
Text
          164,3604,
                       final,
                                    "(15) CIRCULAR";
Text
         5625,4915,
                       final,
                                    " ARC CENTRE";
Text
         5625,4260,
                       final,
Text
         11086,4915,
                       final,
                                    "(16) CIRCULAR";
                                    " ARC CENTRE";
Text
          11086,4260,
                       final,
          11086,3604,
                                    " CLOSE";
Text
                       final.
                                    "(17) ELLIPSE";
Text
         16547,4915,
                       final.
         22008,4915,
                       final.
                                    "(18) ELLIPTICAL";
Text
                                    " ARC";
Text
         22008,4260,
                       final.
Text
         27470,4915,
                       final.
                                    "(19) ELLIPTICAL";
         27470,4260,
                                    " ARC CLOSE";
Text
                       final,
                                    "LINE TYPE";
Text
          1638,2359,
                       final,
CharHeight 200;
% TEXT PARAMETER SUMMARY ------
                                                                                     %
% BUNDLE
               FONT
                         TEXT
                                       EXPAN
                                                   CHAR.
                                                                TEXT
                                                                                     %
% INDEX
               INDEX
                         PRECISION
                                       FACTOR
                                                   SPACE
                                                                COLOUR
                                                                                     %
% default
                                                                                     %
               set
                         set
                                       set
                                                   set
                                                                set
% 1
               3
                         STROKE
                                       0.8
                                                   0.01
                                                                1 black
                                                                                     %
%
                                                                                     %
% CHAR
               CHAR.
                         TEXT
                                       TEXT
                                                   CHAR SET
                                                               ALT CHAR
                                                                                     %
                         PATH
                                                                SET INDEX
% HEIGHT
               ORIENT
                                       ALIGN
                                                   INDEX
                                                                                     %
% set
                                       default
                                                   default
                                                                default
                                                                                     %
               set
                         set
% 200
               0,1,1,0
                         right
                                       normal
                                                   1
                                                                1
                                                                                     %
Text 750,1966, final, "1.";
Text 750,1638,final,"2."
Text 750,1311,final,"3.";
Text 750,983, final, "4.";
Text 750,655,final,"5.";
```

	BUNDLE	FONT	TEXT	EXPAN	CHAR.	TEXT	
	INDEX	INDEX	PRECISION	FACTOR	SPACE	COLOUR	
	default	set	set	set	set	set	
% : %	1	3	STROKE	0.8	0.01	1 black	
	CHAR	CHAR.	TEXT	TEXT	CHAR SET	ALT CHAR	
%	HEIGHT	ORIENT	PATH	ALIGN	INDEX	SET INDEX	
% 5	set	set	set	default	default	default	
% 1	450	0,1,1,0	right	normal	1	1	

EndPIC; EndMF;

Listing for CTN-01r.clr

```
% 91-10-03 11:00 %
BEGMF "CTN-01rd":
   MFVersion 1:
   MFDesc "CTN-01rd, 91-10-03, MIL-D-28003/BASIC-1";
   MFElemList "DRAWINGPLUS";
   VDCType REAL; % more usual: INTEGER %
   MaxColrIndex 255;
   RealPrec -32767.,32767.,6;
   ColrPrec 255;
   ColrIndexPrec 255;
   Fontlist "HERSHEY:SIMPLEX_ROMAN", "HERSHEY:DUPLEX_ROMAN",
         "HERSHEY:COMPLEX_ROMAN";
BegPic "All Graphical Primitive Elements";
   ColrMode INDEXED;
   LineWidthMode SCALED;
   MarkerSizeMode SCALED;
   EdgeWidthMode SCALED;
   VDCExt (0.0,0.0),(1.0,1.0);
   BackColr 255 255 255; % white %
   % MODE
               SUMMARY -----
                                                                                %
                                                                                %
                            LINE WIDTH
                                            MARKER SIZE
                                                             EDGE WIDTH
                COLOUR
               SELECTION SECIFICATION SPECIFICATION
                                                             SPECIFICATION
                                                                                %
   % SCALING
                                            SCALED
                                                             SCALED
                            SCALED
               INDEXED
   % default
BegPicBody;
   ColrTable
                                  %
                                     index
                                             color
           0
                          255
                                  %
                                       0
                                             white
                                                      %
           255
                   255
                                             black
                                  %
                                       1
           0
                   0
                          0
                                  %
                                       2
                                             red
           255
                   0
                          0
                                  %
                                       3
                                                     %
           0
                   255
                          0
                                             green
           0
                   0
                          255
                                  %
                                       4
                                             blue
                                                      %
           255
                   255
                          0
                                  %
                                       5
                                             yellow
                                                      %
                          255
                                  %
                                       6
                                             magenta %
           255
                   0
                                       7
                   255
                          255
                                  %
                                             cvan
           0
                          255
                                  %
                                       8
                                             white
                                                      %
                   255
           255
           255
                   155
                          0;
                                  %
                                             orange
% Box grid %
   EdgeVis ON;
   EdgeWidth 2.0;
   LineType 1;
   LineWidth 2.0;
   LineColr 1;
   % Box and horizontal grid lines %
   % LINE Parameter Summary -----
                          LINE
   % BUNDLE
                 LINE
                                    LINE
                 TYPE
                           WIDTH
                                    COLOUR
                                                                  %
   % INDEX
                                                                  %
   % default
                           set
                                    set
                 set
                                                                  %
                          3.0
                                    1 black
   %1
                 1
```

```
Line (0.0,0.0),(0.0,1.0),(1.0,1.0),(1.0,0.0),(0.0,0.0);
   Line (0.0,0.7000000),(1.0,0.7000000);
   Line (0.0,0.4000000),(1.0,0.4000000);
   Line (0.0,0.1000000),(1.0,0.1000000);
   % Vertical grid lines %
             .1666666,0.1),(0.1666666,1.0);
   Line
   Line
             .3333333,0.1),(0.3333333,1.0);
             .5000000,0.1),(0.5000000,1.0);
   Line
             .6666666,0.0),(0.6666666,1.0);
   Line
             .8333333,0.1),(0.83333333,1.0);
   Line
% Elements %
% Box 1 - POLYLINE %
   LineWidth 4.0;
   LineColr 2:
   % LINE Parameter Summary -----
   % BUNDLE
                   LINE
                             LINE
                                       LINE
                   TYPE
                             WIDTH
                                       COLOUR
   % INDEX
   % default
                   set
                             set
                                       set
   %1
                   1
                             4.0
                                       2 red
   Line (0.0200000,0.82),(0.1466666,0.98),(0.1466666,0.94),
       (0.1033333,0.98),(0.0616666,0.98),(0.1466666,0.90),
       (0.1466666, 0.86), (0.0200000, 0.98), (0.0200000, 0.94),
       (0.1466666, 0.82), (0.1033333, 0.82), (0.0200000, 0.90),
       (0.0200000,0.86),(0.0616666,0.82);
% Box 2 - DISJOINT POLYLINE %
   LineWidth 3.0;
   LineColr 3:
   % LINE Parameter Summary -----
   % BUNDLE
                  LINE
                             LINE
                                       LINE
   % INDEX
                   TYPE
                             WIDTH
                                       COLOUR
   % default
                   set
                             set
                                       set
   %1
                   1
                             3.0
                                       3 green
   DisjtLine (0.3133333,0.82),(0.1866666,0.98),(0.1866666,0.94),(0.2283333,0.98),
            (0.2700000,0.98),(0.1866666,0.90),(0.1866666,0.86),(0.3133333,0.98),
            (0.3133333,0.94),(0.1866666,0.82),(0.2283333,0.82),(0.3133333,0.90),
            (0.31333333,0.86),(0.2700000,0.82);
% Box 3 - POLYMARKER %
   MarkerType 1;
   MarkerSize 1.0;
   MarkerColr 1;
   % MARKER PARAMETER SUMMARY -----
   % BUNDLE
   % INDEX
                                       COLOUR
                  TYPE
                             SIZE
                                                                        %
   % default = 1
                             1.0
                                       1 black
   % -----
   Marker (0.35,0.980);
```

default = 1 (arker (0.38,0.9	2	SIZE	
larker (0.38,0.9		2.0	2 red
farker (0.38,0.9	0.40).		
MarkerType 3;	940);		
MarkerSize 3.0	;		a.
MarkerColr 3;	ARAMET	ER SUM	MARY
% BUNDLE	WINNER	Die Comi	-
% INDEX	TYPE	SIZE	COLOUR
% INDEX % default = 1	3	3.0	3 green
%			3 green
Marker (0.41,0.			
W MADIZED D	3 A D A BAR'I	THE STIME	MARY
% BUNDLE			MARY
% BUNDLE % INDEX	TYPE	SIZE	COLOUR 4 blue
% BUNDLE % INDEX % default = 1	TYPE	SIZE	COLOUR
 MARKER P BUNDLE INDEX default = 1 	TYPE 4	SIZE	COLOUR 4 blue
 % BUNDLE % INDEX % default = 1 Marker (0.44,0 MarkerType 5; 	TYPE 4 0.860);	SIZE	COLOUR 4 blue
 % BUNDLE % INDEX % default = 1 % Marker (0.44,0 MarkerType 5; MarkerSize 1.0 	TYPE 4 0.860);	SIZE	COLOUR 4 blue
% BUNDLE % INDEX % default = 1 % Marker (0.44,0 MarkerType 5; MarkerSize 1.0	TYPE 4 0.860);	SIZE 2.0	COLOUR 4 blue
% BUNDLE % INDEX % default = 1 % Marker (0.44,0 MarkerType 5; MarkerSize 1.0 MarkerColr 6; % MARKER F	TYPE 4 0.860);	SIZE 2.0	COLOUR 4 blue
% BUNDLE % INDEX % default = 1 % Marker (0.44,0 MarkerType 5; MarkerSize 1.0 MarkerColr 6; % MARKER F % BUNDLE	TYPE 4 0.860); c); PARAMET	SIZE 2.0 FER SUM SIZE	COLOUR 4 blue MARY COLOUR

% BUNDLE	FONT	SUMMARY -	EXPAN	CHAR.	TEXT
% INDEX	INDEX	PRECISION		SPACE	COLOUR
6 default	set	default	set	set	set
6 1	1	1	0.8	0.10	6 magenta
6	-	_			
6 CHAR	CHAR.	TEXT	TEXT	CHAR SET	ALT CHAR
6 HEIGHT	ORIENT		ALIGN	INDEX	SET INDEX
% set	set	default	default	default	default
%0.02	0,1,1,0	right	normal	1	1
%					
Text 0.520000	0,0.8200000),final,".ABCD'	' ;		
TextColr 9;					
CharOri -1.0,	1.0,1.0,1.0;	%			
		SUMMARY	EXPAN	CHAR.	TEXT
% BUNDLE	FONT	TEXT		SPACE	COLOUR
% INDEX	INDEX	PRECISION			set
% default	set	default	set	set	
% 1	1	1	0.8	0.10	9 orange
%	~	#HT377#	mazzo	CILAD CEM	ATM OTTAD
% CHAR	CHAR.	TEXT	TEXT		ALT CHAR
% HEIGHT			ALIGN	INDEX	SET INDEX
% set	set	default	default	default	default
% 0.02	-1,1,1,1	right	normal	1	1
%		0 M 1 U A D C D			,
	00 O X5000U	o,final, .ABCD	;		
	00,0.000000				
Text 0.52000					
Fext 0.520000 FextColr 7;					
Text 0.52000 TextColr 7; CharOri 0.0,1	1.0,1.0,0.0;				
Text 0.52000 TextColr 7; CharOri 0.0,1 TextPath LE	1.0,1.0,0.0; FT;	SUMMARY			
Text 0.52000 TextColr 7; CharOri 0.0,1 TextPath LE % TEXT PA	1.0,1.0,0.0; FT; \RAMETER	SUMMARY TEXT	EXPAN	CHAR.	TEXT
Text 0.52000 TextColr 7; CharOri 0.0,1 TextPath LE % TEXT PA % BUNDLE	1.0,1.0,0.0; FT; \RAMETER FONT	TEXT	EXPAN	CHAR. SPACE	
Text 0.52000 TextColr 7; CharOri 0.0,1 TextPath LE % TEXT PA % BUNDLE % INDEX	1.0,1.0,0.0; FT; ARAMETER FONT INDEX	TEXT PRECISION	EXPAN FACTOR	CHAR. SPACE	TEXT
Text 0.52000 TextColr 7; CharOri 0.0,1 TextPath LE % TEXT PA % BUNDLE % INDEX % default	1.0,1.0,0.0; FT; ARAMETER FONT INDEX set	TEXT PRECISION default	EXPAN FACTOR set	CHAR. SPACE set	TEXT COLOUR set
Text 0.52000 TextColr 7; CharOri 0.0,1 TextPath LE % TEXT PA % BUNDLE % INDEX % default % 1	1.0,1.0,0.0; FT; ARAMETER FONT INDEX	TEXT PRECISION	EXPAN FACTOR	CHAR. SPACE	TEXT COLOUR
Text 0.52000 TextColr 7; CharOri 0.0,1 TextPath LE. % TEXT PA % BUNDLE % INDEX % default % 1	1.0,1.0,0.0; FT; ARAMETER FONT INDEX set 1	TEXT PRECISION default 1	EXPAN FACTOR set 0.8	CHAR. SPACE set 0.10	TEXT COLOUR set 7 cyan
Text 0.520000 TextColr 7; CharOri 0.0,1 TextPath LE % TEXT PA % BUNDLE % INDEX % default % 1 % % CHAR	1.0,1.0,0.0; FT; ARAMETER FONT INDEX set 1 CHAR.	TEXT PRECISION default 1 TEXT	EXPAN FACTOR set 0.8 TEXT	CHAR. SPACE set 0.10 CHAR SET	TEXT COLOUR set 7 cyan ALT CHAR
Text 0.52000 TextColr 7; CharOri 0.0,1 TextPath LE	1.0,1.0,0.0; FT; ARAMETER FONT INDEX set 1 CHAR.	TEXT PRECISION default 1	EXPAN FACTOR set 0.8	CHAR. SPACE set 0.10	TEXT COLOUR set 7 cyan

% TEXT PA %BUNDLE	FONT	SUMMARY TEXT	EXPAN	CHAR.	TEXT	
% BUNDLE % INDEX	INDEX	PRECISION		SPACE	COLOUR	
% default	set	default	set	set	set	
% 1	1	1	0.8	0.10	4 blue	
% % CHAR	CHAR.	TEXT	TEXT	CHAR SET	ALT CHAR	
% CHAR % HEIGHT	ORIENT	PATH	ALIGN	INDEX	SET INDEX	
% set	set	set	default	default	default	
% 0.0 2	0,1,1,0	down	normal	1	1	
% Гехt 0.64000(00,0.960000	o,final,"DOW	N";			
ox 5 - RESTR	ICTED TEX	Т %				
LineType 1;	.0122 12	_ ,				
intStyle EMP	TY;					
TextColr 4;				*		
CharHeight 0		•	•			
TextPath RIC			CIIMMADV			
% CLOSED . % INTERIOR		ARAMETER HATCH	PATTERN	EDGE I	EDGE EDGE	
% INTERIOR % STYLE		R INDEX	INDEX		TYPE WIDTH	
% set	set	default	default		lefault set	
% EMPTY	4 blue	1=	1	def = 1		
%						
% EDGE	EDGE	FILL REF				
% COLOUR	VISIBIL					
% default	set	default				
% 1 black %	on	ll corn				
Rect 0.68,0.82	,0.82,0.84;					
Rect 0.68,0.86						
Rect 0.68,0.92	,0.74,0.98;					
		SUMMARY	EVDAN	CHAR.	TEXT	
% BUNDLE % INDEX	FONT INDEX	TEXT PRECISION	EXPAN FACTOR	SPACE	COLOUR	
% INDEX % default	set	default	set	set	set	
% 1	1	STROKE	0.8	0.10	4 blue	
%o						
% CHAR	CHAR.	TEXT	TEXT	CHAR SET	ALT CHAR	
% HEIGHT	ORIENT	PATH	ALIGN	INDEX	SET INDEX	
% set	set	set	default	default	default	
% 0.02	0,1,1,0	right	normal	1	1	
%		0.82,final,"Ab				

CONT NDEX et CHAR. ORIENT et ,1,1,0	SUMMARY TEXT PRECISION default 1 TEXT PATH set right ,notfinal,".AB	EXPAN FACTOR set 0.8 TEXT ALIGN default normal	CHAR. SPACE set 0.10 CHAR SET INDEX default	TEXT COLOUR set 2 red ALT CHA	 : :
NDEX et CHAR. ORIENT et ,1,1,0	PRECISION default 1 TEXT PATH set right	FACTOR set 0.8 TEXT ALIGN default	SPACE set 0.10 CHAR SET INDEX	COLOUR set 2 red	: : R
HAR. PRIENT et ,1,1,0	default 1 TEXT PATH set right	set 0.8 TEXT ALIGN default	set 0.10 CHAR SET INDEX	set 2 red ALT CHAI	: R
HAR. PRIENT et ,1,1,0	TEXT PATH set right	0.8 TEXT ALIGN default	0.10 CHAR SET INDEX	2 red ALT CHA	r.
HAR. ORIENT et ,1,1,0 0.8500000	TEXT PATH set right	TEXT ALIGN default	CHAR SET	ALT CHA	R.
PRIENT et ,1,1,0 0.8500000	PATH set right	ALIGN default	INDEX		R.
et ,1,1,0 0.8500000	set right	default		SET INDE	
,1,1,0 0.8500000	right	_	default		X
0.8500000		normal		default	
	notfinal " AR		1	1	
*	,,	C";			
3;					
;	OTTE A DAY				
		EVDAN	CHAD	weyw	
	,				
	1	0.6	0.10	4 blue	
HAR.	TEXT	TEXT	CHAR SET	ALT CHA	R
	PATH	ALIGN	INDEX		
et	set	default	default	default	
,1,1,0	right	normal	1	1	
l,"+D";		•••••			
N %					
					•
CITER DA	PAMETER S	SIIMMARV .			
					GE
					IDTH
J J C110 W		-	-		
EDGE	FILL REF	CHAR SET	ALT CHR		
			SET NDX		
set			default		
on .			1		
	; .METER ONT NDEX et HAR. PRIENT et .1,1,0 ,"+D"; N % GURE PAFILL COLOUI set 5 yellow EDGE VISIBIL. set on	; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; ;	; METER SUMMARY ONT TEXT EXPAN NDEX PRECISION FACTOR et default set 1 0.8 HAR. TEXT TEXT RIENT PATH ALIGN et set default 1,1,0 right normal ,"+D"; N% GURE PARAMETER SUMMARY FILL HATCH PATTERN COLOUR INDEX INDEX set set default 5 yellow 1=1 1 EDGE FILL REF CHAR SET VISIBIL. POINT INDEX set default default on ll corn 1	COLOUR INDEX Set set default Set set default NDEX Set set default NDEX Set set default NDEX Set set default default NDEX Set set default SET NDEX Set Set default NDEX Set default default default	METER SUMMARY ONT TEXT EXPAN CHAR. TEXT NDEX PRECISION FACTOR SPACE COLOUR et default set set set 1 0.8 0.10 4 blue HAR. TEXT TEXT CHAR SET ALT CHAR PRIENT PATH ALIGN INDEX SET INDE et set default default default 1,1,0 right normal 1 1 "+D"; N% GURE PARAMETER SUMMARY FILL HATCH PATTERN EDGE EDGE EI COLOUR INDEX INDEX BUNDLE TYPE W set set default INDEX default set 5 yellow 1=1 1 def=1 1 2.0 EDGE FILL REF CHAR SET ALT CHR VISIBIL POINT INDEX SET NDX set default default default on ll corn 1 1

PE V fault s	EDGE WIDTH	
PE V fault s		
1	set	
,	1.0	
		%
		%
		%
		% ~
		%
		% %
) L L	.01010 011001 11000 01101	1.0 01010101 011001100 11000111 01101001 01010101

4

0

5

7

0;

%

%

%

%

%

011011011

011001101

011001100

0

0

0

3

3

4

5

0

0

%Box 11 - RECTANGLE %

4

5

6

FillColr 6;

5

0

0

HatchIndex 3;

EdgeWidth 10.0;

EdgeColr 7;

[%] Box 10 not used; GDP not in MIL-D-28003 $\,\%$

```
% CLOSED FIGURE PARAMETER SUMMARY --
                                                                                %
   % INTERIOR
                 FILL
                           HATCH
                                     PATTERN
                                                  EDGE
                                                            EDGE
                                                                    EDGE
                                                                                %
   % STYLE
                 COLOUR INDEX
                                     INDEX
                                                  BUNDLE TYPE
                                                                    WIDTH
                                                                                %
   % set
                 set
                                     default
                                                  INDEX
                                                            default
                           set
                                                                   set
                                                                                %
                                3 /// 1
   % HATCH
                 6 magenta
                                                  def = 1
                                                           1
                                                                    10.0
                                                                                %
   %
                                                                                %
                 EDGE
                           FILL REF CHAR SET
                                                  ALT CHR
   % EDGE
                                                                                %
                                                  SET NDX
   % COLOUR
                 VISIBIL.
                           POINT
                                     INDEX
                                                                                %
   % set
                 set
                           default
                                     default
                                                  default
                                                                                %
   % 7 cyan
                 on
                           ll corn
                                     1
                                                  1
                                                                                %
   % -----
   Rect (0.5200000,0.5200000),(0.6466666,0.6800000);
% Box 12 - CIRCLE %
   FillColr 4;
   HatchIndex 4;
   EdgeWidth 4.0;
   EdgeColr 3:
   % CLOSED FIGURE PARAMETER SUMMARY -
   % INTERIOR
                 FILL
                           HATCH
                                     PATTERN
                                                  EDGE
                                                           EDGE
                                                                   EDGE
                                                                                %
   % STYLE
                 COLOUR INDEX
                                     INDEX
                                                  BUNDLE TYPE
                                                                    WIDTH
                                                                                %
   % set
                 set
                           set
                                     default
                                                  INDEX
                                                           default
                                                                   set
                                                                                %
   % HATCH
                 4 blue
                           4\\\
                                     1
                                                  def = 1
                                                           1
                                                                    4.0
                                                  ALT CHR
   % EDGE
                 EDGE
                           FILL REF CHAR SET
                                                                                %
                 VISIBIL.
   % COLOUR
                           POINT
                                     INDEX
                                                  SET NDX
                                                                                %
   % set
                           default
                                     default
                 set
                                                  default
                                                                                %
   % 3 green
                           ll corn
                                                                                %
   Circle (0.7500000,0.6000000),0.075;
% Box 13 - CIRCULAR ARC 3 POINT %
   LineType 1:
   % LINE Parameter Summary -----
   % BUNDLE
                LINE
                            LINE
                                           LINE
                                                                %
   % INDEX
                TYPE
                             WIDTH
                                           COLOUR
                                                                %
   % default
                set
                            set
                                                                %
                                           set
   %1
                1
                            3.0
                                           3 green
                                                                %
  Arc3Pt (0.9800000,0.6500000) (0.8666666,0.5400000) (0.9500000,0.5200000);
% Box 14 - CIRCULAR ARC 3 POINT CLOSE (CHORD) %
   FillColr 5:
  HatchIndex 5;
   EdgeWidth 2.0;
```

EdgeColr 9;

EdgeColr 6; EdgeVis ON;

```
%
  % CLOSED FIGURE PARAMETER SUMMARY -----
                                                                               %
                                                                  EDGE
                                                          EDGE
                                    PATTERN
                                                EDGE
                          HATCH
  % INTERIOR
                 FILL
                                                                               %
                                                BUNDLE TYPE
                                                                  WIDTH
                 COLOUR INDEX
                                    INDEX
  % STYLE
                                                                               %
                                                INDEX
                                                          default
                                                                  set
                                    default
                          set
                 set
  % set
                                                                               %
                                                 def = 1
                                                                  2.0
                          5 ###
                                    1
  % HATCH
                 5 yellow
                                                                               %
                                                                               %
                                                 ALT CHR
                          FILL REF CHAR SET
                 EDGE
  % EDGE
                                                                               %
                                                 SET NDX
                          POINT
                                    INDEX
                 VISIBIL.
   % COLOUR
                                                                               %
                                                 default
                                    default
                          default
                 set
   % set
                                    1
                          ll corn
                 on
   % 9 orange
   Arc3PtClose (0.1500000,0.3600000) (0.0333333,0.2400000) (0.1166666,0.2000000),chord;
% Box 15 - CIRCULAR ARC CENTRE %
   LineWidth 1.0;
   LineType 1:
   % LINE Parameter Summary -----
                                          LINE
                            LINE
   % BUNDLE
               LINE
                                           COLOUR
                            WIDTH
               TYPE
   % INDEX
                                                               %
                                           set
                            set
                set
   % default
                                                               %
                                           3 green
                            1.0
                1
   %1
                    DXs DYs DXe DYe rad %
   ArcCtr ( 0.25, 0.3), 0.18, 0.32, 0.28, 0.25, 0.075;
% Box 16 - CIRCULAR ARC CENTRE CLOSE (PIE) %
   HatchIndex 6;
   FillColr 2;
   EdgeColr 4;
   EdgeVis OFF;
   % CLOSED FIGURE PARAMETER SUMMARY -----
                                                                   EDGE
                                                           EDGE
                                                 EDGE
                                     PATTERN
                           HATCH
                  FILL
   % INTERIOR
                                                                   WIDTH
                                                                                %
                                                 BUNDLE TYPE
                                     INDEX
                  COLOUR INDEX
   % STYLE
                                                 INDEX
                                                           default
                                                                   set
                                     default
                           set
                  set
   % set
                                                                   2.0
                                                 def = 1
                                                           1
                                     1
   % HATCH
                  2 red
                           6 xxx
                                                                                %
                           FILL REF CHAR SET
                                                 ALT CHR
                  EDGE
   % EDGE
                                                                                %
                                                 SET NDX
                                     INDEX
                  VISIBIL.
                           POINT
   % COLOUR
                                                                                %
                                     default
                                                 default
                           default
                  set
   % set
                                                                                %
                  off
                           ll corn
                                     1
   % 4 blue
                                                           type %
                                          DXe DYe
                                                    rad
                             DXs
                                   DYs
   %
                                          0.48, 0.25, 0.075, pie;
                                   0.32,
   ArcCtrClose (0.416, 0.3),
                             0.18,
% Box 17 - ELLIPSE %
   FillColr 9;
   HatchIndex 4;
```

```
% CLOSED FIGURE PARAMETER SUMMARY ---
   % INTERIOR
                 FILL
                           HATCH
                                     PATTERN
                                                  EDGE
                                                            EDGE
                                                                    EDGE
                                                                                  %
                  COLOUR INDEX
                                     INDEX
                                                  BUNDLE TYPE
                                                                     WIDTH
                                                                                  %
   % STYLE
                                     default
                                                  INDEX
                                                            default
                                                                    set
                                                                                  %
                  set
                            set
   % set
                           4\\\
                                                  def = 1
                                                                    2.0
                                                                                  %
   % HATCH
                                     1
                                                            1
                  9 orange
                                                                                  %
   %
                           FILL REF CHAR SET
                                                  ALT CHR
   % EDGE
                  EDGE
                                                                                  %
                  VISIBIL.
                           POINT
                                     INDEX
                                                  SET NDX
   % COLOUR
                           default
                                                  default
                                                                                  %
                                     default
   % set
                  set
                                                  1
   % 6 magenta
                           ll corn
                                     1
   Ellipse (0.5833331,0.30),0.518,0.24,0.55,0.32;
% Box 18 - ELLIPTICAL ARC %
   LineWidth 6.0;
   LineType 1;
   % LINE Parameter Summary -----
                                            LINE
                             LINE
   % BUNDLE
                LINE
                TYPE
                             WIDTH
                                            COLOUR
                                                                 %
   % INDEX
                                                                 %
   % default
                set
                             set
                                            set
                                                                 %
   %1
                1
                             6.0
                                            3 green
   EllipArc (0.6800000,0.28),
                                          % centre point
                                                                 %
                                          % 1st CDP endpoint
                                                                 %
           (0.5846666, 0.19),
           (0.5966666, 0.31),
                                          % 2nd CDP endpoint
                                                                 %
                                          % DX_start,DY_start
                                                                 %
           (0.04, 0.11),
                                          % DX_end,DY_end
                                                                 %
           (0.10, -0.09);
% Box 19 - ELLIPTICAL ARC CLOSE (PIE) %
   FillColr 3:
   HatchIndex 2:
   EdgeWidth 4.0;
   % CLOSED FIGURE PARAMETER SUMMARY --
   % INTERIOR
                  FILL
                            HATCH
                                     PATTERN
                                                   EDGE
                                                            EDGE
                                                                     EDGE
                                                                                  %
   % STYLE
                  COLOUR INDEX
                                     INDEX
                                                  BUNDLE
                                                            TYPE
                                                                     WIDTH
                                                   INDEX
   % set
                  set
                            set
                                      default
                                                            default
                                                                     set
                                                                                  %
   % HATCH
                  3 green
                            2111
                                     1
                                                   def = 1
                                                            1
                                                                     4.0
                                                                                  %
   %
                                                                                  %
                            FILL REF CHAR SET
   % EDGE
                  EDGE
                                                  ALT CHR
                                                                                  %
                                                  SET NDX
   % COLOUR
                  VISIBIL.
                           POINT
                                     INDEX
                                                                                  %
                            default
                                      default
                                                   default
                                                                                  %
   % set
                  set
                                                                                  %
   % 6 magenta
                  on
                            ll corn
   EllipArcClose (0.85,0.28),
                                       % centre point
                                                           %
                                       % 1st CDP endpoint
               (0.75, 0.19),
                                                           %
               (0.76, 0.31),
                                       % 2nd CDP endpoint
                                                           %
               (0.04, 0.12),
                                       % DX_start,DY_start
                                       % DX_end,DY_end
               (0.10, -0.08),
               pie;
```

inewidth 2.0);			
ineType 5;	C			
6 LINE Par 6 BUNDLE	ameter Summar	LINE	LINE	
W DONDER	TYPE	WIDTH	COLOUR	
% default	got	set	set	
	5 dash-dot-dot	2.0	set 2 red	
%				
Line (0.05,0.0)2),(0.6,0.02);			
LineType 4;				
% LINE Par	rameter Summai	гу		
% BUNDLE	rameter Summan LINE TYPE set	LINE	LINE	
% INDEX	TYPE	WIDTH	COLOUR set	
% default	set	set	set o d	
% 1	set 4 dash-dot	2.0	2 red	
LineType 3;				
TIME DO	rameter Summa	rv		
70 LINE FAI	ameter bamma			
% BUNDLE	LINE	LINE	LINE	
% BUNDLE	LINE TYPE	LINE WIDTH	LINE	
% BUNDLE % INDEX % default	TYPE set	WIDTH set	COLOUR set	
% BUNDLE % INDEX % default % 1	TYPE set 3 dot	WIDTH set 2.0	COLOUR set 2 red	
% BUNDLE % INDEX % default % 1 %	LINE TYPE set 3 dot	WIDTH set 2.0	COLOUR set	
% BUNDLE % INDEX % default % 1 %Line (0.05,0.0	TYPE set 3 dot	WIDTH set 2.0	COLOUR set 2 red	
% BUNDLE % INDEX % default % 1 % Line (0.05,0.0	LINE TYPE set 3 dot 04),(0.6,0.04);	WIDTH set 2.0	COLOUR set 2 red	
% BUNDLE % INDEX % default % 1 % Line (0.05,0.0 LineType 2; % LINE Par % BUNDLE	LINE TYPE set 3 dot 04),(0.6,0.04); rameter Summa	LINE WIDTH set 2.0	COLOUR set 2 red	
% BUNDLE % INDEX % default % 1 % Line (0.05,0.0 LineType 2; % LINE Par % BUNDLE % INDEX	LINE TYPE set 3 dot 04),(0.6,0.04); rameter Summa: LINE TYPE	LINE WIDTH set 2.0	COLOUR set 2 red	
% BUNDLE % INDEX % default % 1 % Line (0.05,0.0 LineType 2; % LINE Par % BUNDLE % INDEX	LINE TYPE set 3 dot 04),(0.6,0.04); rameter Summa: LINE TYPE	LINE WIDTH set 2.0	COLOUR set 2 red	
% BUNDLE % INDEX % default % 1 % Line (0.05,0.0 LineType 2; % LINE Par % BUNDLE	LINE TYPE set 3 dot 04),(0.6,0.04); rameter Summa LINE TYPE set	LINE WIDTH set 2.0 ry LINE WIDTH set	LINE COLOUR set 2 red LINE COLOUR	
% BUNDLE % INDEX % default % 1 Line (0.05,0.0 LineType 2; % LINE Par % BUNDLE % INDEX % default % 1	LINE TYPE set 3 dot 04),(0.6,0.04); rameter Summa: LINE TYPE set 2 dash	LINE WIDTH set 2.0 ry LINE WIDTH set 2.0	LINE COLOUR set 2 red LINE COLOUR set	
% BUNDLE % INDEX % default % 1 % Line (0.05,0.0 LineType 2; % LINE Par % BUNDLE % INDEX % default % 1	LINE TYPE set 3 dot 04),(0.6,0.04); rameter Summa: LINE TYPE set 2 dash	LINE WIDTH set 2.0 ry LINE WIDTH set 2.0	LINE COLOUR set 2 red LINE COLOUR set 2 red	
% BUNDLE % INDEX % default % 1 % Line (0.05,0.4 LineType 2; % LINE Par % BUNDLE % INDEX % default % 1 % Line (0.05,0.4 LineType 1;	LINE TYPE set 3 dot 04),(0.6,0.04); rameter Summa: LINE TYPE set 2 dash 05),(0.6,0.05);	LINE WIDTH set 2.0 TY LINE WIDTH set 2.0	LINE COLOUR set 2 red LINE COLOUR set 2 red	
% BUNDLE % INDEX % default % 1 %	LINE TYPE set 3 dot 04),(0.6,0.04); rameter Summa: LINE TYPE set 2 dash	LINE WIDTH set 2.0 TY LINE WIDTH set 2.0	LINE COLOUR set 2 red LINE COLOUR set 2 red	
% BUNDLE % INDEX % default % 1 % Line (0.05,0.4 LineType 2; % LINE Pai % BUNDLE % INDEX % default % 1 % Line (0.05,0.4 LineType 1; % LINE Pai % BUNDLE	LINE TYPE set 3 dot 04),(0.6,0.04); rameter Summa: LINE TYPE set 2 dash 05),(0.6,0.05); rameter Summa: LINE	LINE WIDTH set 2.0 TY LINE WIDTH set 2.0	LINE COLOUR set 2 red LINE COLOUR set 2 red	
% BUNDLE % INDEX % default % 1 % Line (0.05,0.0 LineType 2; % LINE Par % BUNDLE % INDEX % default % 1 % Line (0.05,0.0 LineType 1; % LINE Par % BUNDLE % BUNDLE % BUNDLE	LINE TYPE set 3 dot 04),(0.6,0.04); rameter Summa: LINE TYPE set 2 dash 05),(0.6,0.05);	LINE WIDTH set 2.0 TY LINE WIDTH set 2.0	LINE COLOUR set 2 red LINE COLOUR set 2 red LINE COLOUR	
% BUNDLE % INDEX % default % 1 % Line (0.05,0.4 LineType 2; % LINE Pai % BUNDLE % INDEX % default % 1 % Line (0.05,0.4 LineType 1; % LINE Pai % BUNDLE	LINE TYPE set 3 dot 04),(0.6,0.04); rameter Summa: LINE TYPE set 2 dash 05),(0.6,0.05); rameter Summa: LINE	LINE WIDTH set 2.0 TY LINE WIDTH set 2.0	LINE COLOUR set 2 red LINE COLOUR set 2 red	

```
% Labels in Boxes %
   TextFontindex 3:
   TextPrec STROKE;
   CharExpan 0.8;
   CharSpace 0.10;
   TextColr 1;
   CharHeight 0.015;
   CharOri 0.0,1.0,1.0,0.0;
   TextPath RIGHT:
   % TEXT PARAMETER SUMMARY
                 FONT
                                           EXPAN
   % BUNDLE
                            TEXT
                                                       CHAR.
                                                                    TEXT
                                                                                          %
   % INDEX
                 INDEX
                            PRECISION
                                           FACTOR
                                                       SPACE
                                                                    COLOUR
                                                                                          %
   % default
                  set
                            set
                                           set
                                                       set
                                                                    set
                                                                                          %
   % 1
                            STROKE
                                           0.8
                  3
                                                       0.10
                                                                    1 black
   %
   % CHAR
                  CHAR.
                            TEXT
                                           TEXT
                                                       CHAR SET
                                                                   ALT CHAR
                                                                                          %
                  ORIENT
   % HEIGHT
                            PATH
                                           ALIGN
                                                       INDEX
                                                                    SET INDEX
                                                                                          %
   % set
                  set
                            set
                                           default
                                                       default
                                                                    default
                                                                                          %
   % 0.015
                                           normal
                  0,1,1,0
                            right
                                                                    1
                                                                                          %
   %
                                                  "(1) POLYLINE";
   Text
            0.0050000,0.7500000,
                                       final.
                                                  "(2) DISJOINT";
            0.1716666, 0.7500000,
                                       final.
   Text
                                                  " POLYLINE";
   Text
            0.1716666, 0.7300000,
                                       final.
   Text
            0.3383333,0.7500000,
                                       final.
                                                  "(3) POLYMARKER";
   Text
            0.5050000, 0.7500000,
                                       final,
                                                  "(4) TEXT";
   Text
                                                  "(5) RESTRICTED";
            0.6716666, 0.7500000,
                                       final,
                                                  " TEXT";
   Text
            0.6716666, 0.7300000,
                                       final,
   Text
            0.8383333,0.7500000,
                                       final,
                                                  "(6) APPEND";
                                                  " TEXT";
   Text
            0.8383333,0.7300000,
                                       final,
            0.0050000, 0.4500000,
                                                  "(7) POLYGON";
   Text
                                       final,
   Text
                                                  "(8) POLYGON";
            0.1716666, 0.4500000,
                                       final,
   Text
                                                  " SET";
            0.1716666, 0.4300000,
                                       final,
   Text
            0.3383333,0.4500000,
                                       final.
                                                  "(9) CELL";
                                       final,
   Text
            0.3383333,0.4300000,
                                                    ARRAY";
   % Not Included - - - - - - (10) GENERALIZED DRAWING PRIMITIVE (GDP) - %
   Text
            0.5050000,0.4500000,
                                       final.
                                                  "(11) RECTANGLE":
   Text
            0.6716666, 0.4500000,
                                                  "(12) CIRCLE";
                                       final,
   Text
                                                  "(13) CIRCULAR";
            0.8383333,0.4500000,
                                       final,
                                                  " ARC 3 POINT";
            0.8383333,0.4300000,
   Text
                                       final.
   Text
            0.0050000,0.1500000,
                                       final.
                                                  "(14) CIRCULAR";
   Text
            0.0050000,0,1300000,
                                       final,
                                                  " ARC 3 POINT";
                                                  " CLOSE";
   Text
            0.0050000,0.1100000,
                                       final,
   Text
                                                  "(15) CIRCULAR";
            0.1716666, 0.1500000,
                                       final,
   Text
            0.1716666, 0.1300000,
                                                   ARC CENTRE":
                                       final.
   Text
            0.3383333,0.1500000,
                                       final,
                                                  "(16) CIRCULAR";
   Text
            0.3383333,0.1300000,
                                       final,
                                                   ARC CENTRE";
                                                  " CLOSE";
   Text
            0.3383333,0.1100000,
                                       final,
   Text
            0.5050000,0.1500000,
                                       final,
                                                  "(17) ELLIPSE";
   Text
            0.6716666, 0.1500000,
                                       final,
                                                  "(18) ELLIPTICAL";
   Text
                                                    ARC";
            0.6716666,0.1300000,
                                       final,
   Text
            0.8383333,0.1500000,
                                       final.
                                                  "(19) ELLIPTICAL":
                                                  " ARC CLOSE";
   Text
            0.8383333,0.1300000,
                                       final,
   Text
            0.05,0.072,
                                                  "LINE TYPE";
                                       final,
```

% TEXT PA % BUNDLE % INDEX % default % 1 %	RAMETER FONT INDEX set 3	SUMMARY TEXT PRECISION set STROKE	EXPAN FACTOR set 0.8	CHAR. SPACE set 0.10.	TEXT COLOUR set 1 black	
% CHAR	CHAR.	TEXT	TEXT	CHAR SET		
% HEIGHT	ORIENT	PATH	ALIGN	INDEX	SET INDEX	
% set	set	set	default	default	default	
% 0.007	0,1,1,0	right	normal	1	1	
%						-
Text (.0229,.	060),final,"	l.";				
Text (.0229,.	050),final,"2	2.";				
Text (.0229,.	040),final,"3	3.";				
Text (.0229,.	030),final,"4	1 .";				
Text (.0229,.	020),final,"	5.";				
Figure Label % CharHeight 0 % TEXT PA	.015;	SUMMARY				_
% BUNDLE	FONT	TEXT	EXPAN	CHAR.	TEXT	
% INDEX	INDEX	PRECISION	FACTOR	SPACE	COLOUR	
% default	set	set	set	set	set	
% 1	3	STROKE	0.8	0.10	1 black	
%						
% CHAR	CHAR.	TEXT	TEXT	CHAR SET	ALT CHAR	
% HEIGHT	ORIENT	PATH	ALIGN	INDEX	SET INDEX	
% set	set	set	default	default	default	.*
% 0.015	0,1,1,0	right	normal	1	1	-
	333,0.057000	00,final,"CALS 00,final,"MIL-D	-28003";		·	•
Text 0.67333	333,0.03400	00,final,"Compu	iter Graphics	-10-03"·		
Text 0.67333	333,0.03400	00,final,"Compt 00,final,"File: C	TN-01Rd, 91	-10-03";		
Text 0.67333	333,0.03400	00,final,"Compt 00,final,"File: C	TN-01Rd, 91	-10-03";		

ATTACHMENT G

Glossary

Clear Text:

One method for encoding a CGM, the other two being character encoding and binary. Of the three encodings, clear text is the most like English, and is thus easier for people to read than the number-oriented binary and character encodings. Multiple encodings exist as trade-offs between short file size and human readability. To be compatible with MIL-D-28003, a CGM must eventually be in binary format.

Computer Graphics

Metafile:

The specification, as designated in ANSI/ISO 8632, for storing and transferring two-dimensional picture (lines and shapes) data.

Element:

A functional item that can be used to construct a picture or convey information. Examples are a circle, a line, a color, a linewidth, and text.

MIL-STD-1840A:

Military Standard, "Automated Interchange of Technical Information." This standard defines methods for the digital transmission of technical information necessary for the logistic support of weapons systems throughout their life cycle. MIL-STD-1840A acts as the "parent" standard for a suite of specifications, including MIL-D-28003 (CGM).

MIL-D-28003:

Military Specification, "Digital Representation for Communication of Illustration Data: CGM Application Profile." This specification establishes requirements for digital delivery of 2-dimensional vector images via the digital format of the CGM (Computer Graphics Metafile). MIL-D-28003 is a subset of the ANSI/ISO 8632 standard.

Pixel:

Picture Element. A computer screen displays a picture as a series of discrete rectangles or squares called pixels. Each pixel, the smallest unit of picture display, contains only one color-shaded value. Complex images can be formed, building upon the simple pixel, since the human eye tends to blend the colors into a continuous image.

Raster Data:

Image data stored (and transmitted) as a regular 2-D array of pixels.

Vector Data:

Image data stored (and transmitted) as lines. In the case of CGM, vector image data need not be limited to straight line segments, but may also consist of graphical elements such as circles, and arcs, defined by mathematical equations.

ATTACHMENT H List of Acronyms and Abbreviations

ANSI: American National Standards Institute

ASCII: American Standard Code for Information Interchange

CALS: Computer-aided Acquisition and Logistic Support

CGM: Computer Graphics Metafile

CTN: CALS Test Network

DoD: Department of Defense

ISO: International Organization for Standardization, commonly known as

International Standards Organization in the United States

MIL-STD-1840A: Military Standard, "Automated Interchange of Technical Information"

MIL-D-28003: Military Specification, "Digital Representation for Communication of

Illustration Data: CGM Application Profile"

Pixel: Picture Element

2-D: Two-dimensional